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## Breast cancer related perceptions and practices of health professionals working in Brazil's network of primary care units\*

Benjamin D. Hallowell<sup>a</sup>, Douglas M. Puricelli Perin<sup>a</sup>, Eduardo J. Simoes<sup>b</sup>, Diana C. Paez<sup>c</sup>, Diana C. Parra<sup>c</sup>, Ross C. Brownson<sup>c,d</sup>, and Mona Saraiya<sup>a,\*</sup>

<sup>a</sup>Division of Cancer Prevention and Control, Centers for Disease Control and Prevention, Atlanta, GA, United States

<sup>b</sup>Department of Health Management and Informatics, University of Missouri School of Medicine, One Hospital Drive, CE707 CS&E Bldg, Columbia, MO 65212, United States

<sup>c</sup>Prevention Research Center in St. Louis, Brown School, Washington University in St. Louis, St. Louis, MO 63130, United States

<sup>d</sup>Department of Surgery and Alvin J. Siteman Cancer Center, Washington University School of Medicine, Washington University in St. Louis, St. Louis, MO 63130, United States

### Abstract

In 2004 the Brazilian National Cancer Institute (INCA) established breast cancer screening guidelines for women in Brazil: annual clinical breast exam for women age 40–49 and biennial mammogram for women age 50–69. Healthcare provider's adherence to these guidelines is currently unknown. The objective of this study is to describe the perceptions and practices related to breast cancer screening among physicians, nurses, and health unit coordinators working in the network of primary healthcare units (HCUs) in Brazil.

In 2011, 1600 primary HCUs were randomly sampled from all regions in Brazil. At each HCU the coordinator and one health professional were asked to participate in a telephone survey to gathered information on their knowledge, attitudes, and practices related to breast cancer screening. Participation rates for coordinators, physicians, and nurses were 78%, 34%, and 65% respectively.

Health unit coordinators identified numerous barriers that prevent patients from receiving appropriate screening, many (44%) were unaware of INCA cancer screening guidelines. Despite a high perceived impact of INCA guidelines, a majority of physicians and nurses did not follow them. Most physicians and nurses recommended mammograms on an annual basis (~75%) and 50.9% of nurses and 25.1% of physicians initiated routine breast cancer screening in women under age 40.

Physicians and nurses in Brazil screen at younger ages and more frequently than recommended by INCA guidelines. Given that primary HCUs are the source of health care for many women,

\*The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

\*Corresponding author at: Division of Cancer Prevention and Control, CDC/NCCDPPH, 4770 Buford Hwy, NE, Mailstop F76, Atlanta, GA 30341, United States. yzs2@cdc.gov (M. Saraiya).

interventions that educate healthcare providers on the appropriate ages and intervals for breast cancer screening may prove useful.

## Keywords

Cancer screening; Breast cancer; Mammography; Clinical breast exam; Breast cancer screening; Brazil; Physician; Nurse; Breast

## 1. Introduction

Breast cancer is the most common cancer in women worldwide and 70% of deaths from breast cancer occur in low and middle-income countries (Mathers et al., 2008). The incidence of breast cancer in Latin American countries is generally lower compared with high-income countries (Curado et al., 2007), whereas the mortality rate is higher (Pisani et al., 2002). In 2012, approximately 52,000 new cases of breast cancer were reported in Brazil (Silva et al., 2011), and the mortality rate has increased from 9.2 per 100,000 women in 1980 to 11.3 per 100,000 women in 2009 (Freitas-Junior et al., 2012). The highest rates of breast cancer are noted in southern Brazil (INCA, 2012).

All Brazilian citizens have the right to procure free medical assistance from the public healthcare system called the Unified Health System (SUS). Cancer care services are provided within the network of primary healthcare units (HCUs) known as the Family Health Program (M.d. Saúde Brasil and d.N.d. Câncer, 2009). These services have been expanded through the public system into state or regional referral centers that are responsible for providing diagnosis and treatment (Política nacional de atenção oncológica, 2010). A multidisciplinary team including physicians, nurses and community health workers play a crucial role in conducting cancer prevention and control activities (Política nacional de atenção oncológica, 2010).

Screening guidelines established by Brazilian National Cancer Institute (INCA) recommend breast cancer screening initiation at age 40 for asymptomatic women at average risk, and 35 for high-risk women (Precoco, 2004). An annual clinical breast exam (CBE) is recommended for women aged 40 to 49 years and screening mammography every two years for women aged 50 to 69 years (Lima-Costa and Matos, 2007). Health care provider's adherence to breast cancer screening guidelines is unknown. Literature has reported that only 35% of Brazilian women aged 50 to 69 years receive appropriate breast cancer screening, and 50% of women older than 50 years have had at least one mammogram (Lima-Costa and Matos, 2007), but few receive regular screening (Marinho et al., 2008). In addition, 45% of screening mammograms in Brazil were undertaken in women younger than 50 years (Simon et al., 2009; Marchi and Gurgel, 2010). Few users of public health services in Brazil are aware or receive information about breast cancer screening methods and practices (i.e., mammography) (Gonçalves-Silva et al., 2010).

Physicians and nurses are a direct source of health information for the population, the information they provide must be accurate and the recommended screening procedures appropriate (Gonçalves-Silva et al., 2010). Since the most common reported barrier to

mammography is the absence of referral by providers working in health care settings, it is important to determine which factors may influence provider's adherence to breast cancer screening guidelines in Brazil. The identification of these factors could be useful to develop strategies to improve early diagnosis and treatment of breast cancer.

The objective of our study is to describe the demographic characteristics, perceptions and practices related to adherence of breast cancer screening guidelines among physicians and nurses working in the network of primary HCUs in Brazil, and determine which factors may influence their adherence to these screening guidelines.

## 2. Methods

As part of the Guide for Useful Interventions for Physical Activity in Brazil and Latin America (GUIA) project, a telephone survey was administered to health unit coordinators and health professionals in Brazil. Two surveys were developed (one for unit coordinators, one of health professionals) as part of the GUIA project ([www.projectguia.org](http://www.projectguia.org)), focusing on gathering information on individual's knowledge, attitudes, and practices related to physical activity, nutrition, and cancer. Of the 42,486 HCUs in Brazil, 1600 primary HCUs were randomly sampled for inclusion in the GUIA project. At each selected HCU, phone interviews were conducted with the health unit coordinator and one health professional (physician, nurse, or community health worker). The original sample included 1600 health unit coordinators, 534 physicians, 533 nurses, and 533 community health workers. There were no exclusion criteria and participation was voluntary. In total 1251 coordinators (78%), 347 nurses (65%), 182 physicians (34%), and 273 community health workers (51%) agreed to participate. The present analysis relied only on data from coordinators, physicians, and nurses, as they are responsible for breast cancer screening activities in Brazil, and community health workers were not asked breast cancer screening questions. More details about the design and sampling methods can be found elsewhere (Perin et al., 2015; Stormo et al., 2014). This study was reviewed and approved by the Research Ethics Committee of the Federal University of Pelotas, and the institutional review boards of Washington University in St. Louis and the U.S. Centers for Disease Control and Prevention.

The survey for health unit coordinators contained questions related to the coordinator's knowledge of breast cancer screening, the health units' capacity to provide breast cancer screening services, and barriers patients faced in receiving appropriate screening services. The survey for physicians and nurses focused on the perceived effectiveness of breast cancer screening measures, their breast cancer screening practices, and their adherence to INCA's breast cancer screening guidelines. The six questions included in this study from the coordinator survey, and the nine questions included in this study from the physician and nurse survey can be observed in Table A.1 and Table A.2 respectively. Information on survey development, implementation, and pilot testing has been previously described (Perin et al., 2015; Stormo et al., 2014).

### 2.1. Statistical analyses

For the coordinator survey we summarized responses pertaining to breast cancer screening practices and barriers that were reported by health unit coordinators. For the health

professional survey, we conducted bivariate analyses to examine differences between nurses and physicians regarding gender, age, race, region, patients seen per week, hours worked per week, years since graduation, and breast cancer related perceptions, practices and adherence to INCA screening guidelines. We used Pearson chi-square to test statistical differences ( $\alpha = 0.05$ ).

To determine if breast cancer knowledge or attitudes impacted health professional's breast cancer screening practices, we limited the analysis to individuals who self-reported that they partook in breast cancer screening and compared individuals knowledge and attitudes with their screening practices using Pearson chi-square to test for statistical differences ( $\alpha = 0.05$ ).

### 3. Results

#### 3.1. Implementation and barriers to breast cancer screening at HCUs — coordinator survey

In the coordinator survey, 45% of health unit coordinators reported that they were unaware of INCA recommendations for cancer screening. Among health unit coordinators that were aware of INCA screening guidelines, 98% reported that their unit followed the INCA recommendations for the early detection of breast cancer. Coordinators identified a number of barriers to breast cancer screening including; difficulty in performing mammograms (47.8%), difficulties in making or re-scheduling appointments (47.4%), long wait times on exam days (46.0%), difficulty in marking X-rays (37.7%), and difficulty scheduling appointments to discuss mammography results (29.6%; Table 1).

#### 3.2. Provider characteristics and attitudes, perceptions, and practice of breast cancer screening

When compared to nurses, physicians were more likely to be male, older (mean age 40.5 vs. 32.6), out of school longer, work fewer hours and see more patients per week. Reflective of the general population distribution, most physicians and nurses were practicing in the southeast or northeast of Brazil (Table 2).

The majority of physicians and nurses perceived the INCA breast cancer screening recommendations as very influential in their health care unit (62.7%). More often than physicians, nurses perceived the clinical breast exam ( $p = 0.02$ ), self-breast exam ( $p < 0.001$ ), and mammograms for women between 40 and 49 years old ( $p < 0.001$ ) as very effective at reducing breast cancer mortality. Film mammography for women 50 years and older was perceived as very effective by 98% of physicians and 95% of nurses. Doctors felt more prepared to talk about breast cancer with patients when compared to nurses ( $p = 0.0043$ ; Table 3).

Nurses were more likely to report that they initiated clinical breast exams or mammograms in women under 40 years old when compared to physicians ( $p < 0.0001$ ), with 50.9% of nurses and 25.1% of physicians reporting that they initiated routine breast cancer screening in women below age 40. A majority of physicians and nurses recommended annual clinical breast exams and annual mammograms for their patients (Table 3). No demographic or

regional characteristics were found to be associated with screening compliance among physicians or nurses.

### 3.3. Comparing breast cancer screening attitudes and perceptions to screening practices and intentions

When comparing breast cancer knowledge and attitudes to physicians self-reported breast cancer screening practices, physicians who believed that mammograms in women age 40–49 were very effective at reducing breast cancer mortality were more likely to report initiating breast cancer screening before age 40 with their patients. Although not significant at the  $p = 0.05$  level, physicians who self-reported that they were prepared to talk to patients about breast cancer were more likely to report that they began breast cancer screening in women who were  $> 40$  years old (Table 4). When comparing breast cancer knowledge and attitudes of nurses with their self-reported breast cancer screening practices, no significant differences arose at the  $p = 0.05$  level (Table 5).

## 4. Discussion

In Brazil, the vast majority of physicians and nurses of SUS are initiating breast cancer screening with their patients, which is to be expected as policies are in place to ensure that all women can access these services. Although most physicians and nurses of SUS considered the INCA breast cancer screening guidelines as very influential at their primary HCU, many health professionals did not appear to be following the guidelines and were over screening the eligible population. The results from this study suggest that health professionals in the Brazilian SUS screen patients more frequently and initiate screening at younger ages than recommended by INCA guidelines, which is likely negatively impacting the cost-effectiveness of the breast cancer screening program in Brazil. Given the limited time of physicians and nurses of SUS, stricter adherence to INCA guidelines would decrease their screening load and improve their capacity to screen age-eligible women in the population.

Despite the INCA recommendation issued in 2004 to give mammograms biennially to women age 50–69, 72.3% of physicians and 73.5% of nurses in this study recommend mammograms to their patients on an annual basis. It is important to note that biennial screening is not unique to the INCA screening guidelines, and the World Health Organization (WHO), the International Agency for Research on Cancer (IARC), and the US Preventive Services Task Force (USPSTF) all currently recommend biennial breast cancer screening via mammography for women aged 50–69 at a minimum (Mandelblatt et al., 2009; Lauby-Secretan et al., 2015; World Health Organization, 2014; US Preventive Services Task Force, 2016). For women 40–49, WHO, IARC, and the USPSTF recommend biennial screening if the women value the potential benefit of mammography more than the harms after a discussion with their healthcare provider (Mandelblatt et al., 2009; Lauby-Secretan et al., 2015; World Health Organization, 2014; US Preventive Services Task Force, 2016).

Unfortunately, while this study recorded the age at which physicians and nurses initiated breast cancer screening, it did not differentiate between the age of initiation for clinical

breast exams vs. mammography. Despite this, while INCA recommends annual clinical breast exams for women age 40–49, 50.9% of nurses and 25.1% of physicians in our study began breast cancer screening in women before age 40. While previous work in low and middle income countries has shown that clinical breast exams do not lower breast cancer mortality, screened women are significantly more likely to present with smaller tumors and at earlier stages than women receiving education alone (Mittra et al., 2010). These results suggest that clinical breast exams could potentially lower breast cancer mortality among screened women when longer follow-up information is available. Potentially due to an overestimation of the impact that mammograms have among women age 40–49, physicians who believed that mammograms in women age 40–49 were very effective at reducing breast cancer mortality were more likely to report initiating breast cancer screening before age 40.

It is likely that physicians and nurses of SUS are initiating screening younger and more frequently than guidelines suggest because they believe it to be beneficial to their patients. However, at the population level, this is not the case. Previous modeling studies have found that biennial screening of women aged 50–69 with mammography reduces breast cancer related mortality by 16.5% (Mandelblatt et al., 2009). When the age limit was lowered to 40, only an additional 3% of breast cancer related deaths were prevented (Mandelblatt et al., 2009). Given that a majority of breast cancer tumors are slow growing, increasing screening from biennially to annually added negligible survival benefit (Mandelblatt et al., 2009).

The results from this study suggest that SUS health professionals are over screening Brazilian women, potentially due to inaccurate assumptions on the efficacy of screening women younger and more frequently than INCA guidelines suggest. One possible contributing factor for over screening young women by SUS physicians and nurses is the lower SES of SUS patients (Gragnotati et al., 2013). Low SES women who are young may work long and odds hours, thus creating barriers for scheduling screening. Since these women have greater utilization of SUS primary care services due to prenatal care and highly prevalent pediatric issues, physicians and nurse may take advantage of these opportunities to overcompensate scheduling barriers with aggressive scheduling of screening. Educating health professionals on the efficacy of breast cancer screening, appropriate screening intervals, and the ideal age of screening initiation, may help reduce the number of mammograms provided by primary HCUs, allowing them to further expand their coverage of the age-eligible population.

When implementing a population-based cancer screening program, it is essential to eliminate barriers at every step of the screening process to maximize program participation and program effectiveness. When inquiring about the barriers that women face when undergoing breast cancer screening at their primary HCU, 76% of health unit coordinators listed at least one barrier that women face in receiving adequate breast cancer screening, and 39% of health unit coordinators listing two or more barriers. Many of the barriers reported by health unit coordinators (long wait times on exam day, difficulty making appointments, etc.) would likely be exacerbated by over screening, and it is possible that stricter adherence to INCA screening guidelines could alleviate many of these barriers. In addition, knowledge of these barriers is important for both improving coverage and the follow-up of abnormal results.



Given the minimal benefit of providing mammograms to women age 40–49 (Mandelblatt et al., 2009) when such a large portion (65%) of women age 50–69 do not receive adequate screening, more focus could be placed on screening older (rather than younger) women. Brazil doesn't have an organized national or regional breast cancer screening but exams are performed in an opportunistic manner (Ministério da Saúde, 2004). The lack of a systematic method to invite and monitor women who are screened may contribute to this discrepancy and also lead to over screening, although our survey wasn't designed to assess these issues. With an expansion of coverage, a focus on providing mammograms to the target age range, and screening biennially, an organized breast cancer screening program in Brazil could be more cost effective and would prevent more breast cancer related deaths than the current approach (Duffy et al., 2002).

#### 4.1. Study limitations

This study has a few limitations. All data gathered for this study were collected by self-report, and it is possible that recall or social desirability bias impacted the results. The participation rate among physicians was low and results could potentially change given higher participation rates or sample sizes. This is, however, the first study to gather information on individual's knowledge, attitudes, and practices related to breast cancer screening in Brazil. While the 1251 primary HCUs that agreed to participate are likely representative of Brazil's primary HCU network, only 75% of the population utilize SUS and it is possible that these findings are not representative of providers who practice in the private setting (Cecilio et al., 2015).

### 5. Conclusions

In conclusion, stricter adherence to screening guidelines would allow for improved coverage of the population, and work to reduce the numerous barriers to breast cancer screening reported by primary HCU coordinators that are likely exacerbated by over screening. Educating health care providers on the effectiveness of mammograms at various age intervals could be conducted to improve their adherence to INCA guidelines. Although initiating mammography at younger ages and screening on an annual basis can prevent additional breast cancer deaths, given the large percentage of the population who are not covered by the minimum screening standards, stricter adherence to INCA screening recommendations could expand coverage and save more lives than the current approach.

## Appendix A

**Table A.1**

Survey questions on breast cancer-related attitudes, knowledge, and barriers administered to coordinators; GUIA, 2011, Brazil.

Item and response categories	
1	Do you know INCA recommendations for cancer screening? <sup>a</sup>
	– Yes
	– No
2	Does your unit follow the INCA recommendations for the early detection of breast cancer? <sup>a</sup>

Item and response categories	
	– Yes
	– No
3	Does your unit carry out outreach or tracking activities for breast cancer screening? <sup>a</sup>
	– Yes
	– No
4	Does your unit accompany women who have not returned to discuss the results of mammography with a health professional? <sup>a</sup>
	– Yes
	– No
5	How does your unit follow patients who did not return to discuss the results of their mammogram? <sup>a</sup>
	– Telephone (yes/no)
	– Home visits (yes/no)
	– Other (yes/no)
6	Patients may encounter several barriers that prevent them from receiving comprehensive early detection of cancer. For each possible barrier listed, respond if it is not a barrier, is sometimes a barrier, or is definitely a barrier.
	– Difficulties to receive radiography
	– Difficulties to receive a mammogram
	– Difficulties in making or rescheduling an appointment
	– Long wait time on exam day
	– Difficulty scheduling to discuss mammogram results

<sup>a</sup>Questions included a “Do not know” category.

**Table A.2**

Survey questions on breast cancer-related attitudes, knowledge, and practices administered to physicians and nurses working in Brazil’s network of primary care units; GUIA, 2011, Brazil.

Item and response categories	
1	In 2004, INCA released a consensus on the recommended frequency of clinical breast exams and mammograms for women with no symptoms, at medium, or high risk of developing breast cancer. At the health unit where you work would you say this guideline is...
	– Very influential
	– Not very influential
	– Not influential
2	How effective do you believe breast self-examination is in reducing breast cancer mortality?
	– Very effective
	– Slightly effective
	– Not effective
	– Effectiveness not known
3	How effective do you believe clinical breast exams are in reducing breast cancer mortality?
	– Very effective
	– Slightly effective
	– Not effective
	– Effectiveness not known



Item and response categories	
4	How effective do you believe mammograms for women aged 40–49 is in reducing breast cancer mortality? <ul style="list-style-type: none"> <li>– Very effective</li> <li>– Slightly effective</li> <li>– Not effective</li> <li>– Effectiveness not known</li> </ul>
5	How effective do you believe mammograms for women over age 50 is in reducing breast cancer mortality? <ul style="list-style-type: none"> <li>– Very effective</li> <li>– Slightly effective</li> <li>– Not effective</li> <li>– Effectiveness not known</li> </ul>
6	At what age do you start routine breast cancer screening? <ul style="list-style-type: none"> <li>&lt; 40 years</li> <li>40–45 years</li> <li>45–49 years</li> <li>50 years</li> </ul>
7	How often do you request that your patients receive a clinical breast examination? <ul style="list-style-type: none"> <li>Every ____ years</li> </ul>
8	How often do you request that your patients receive a mammogram? <ul style="list-style-type: none"> <li>Every ____ years</li> </ul>
9	How prepared do you feel to talk to patients about breast cancer? <ul style="list-style-type: none"> <li>Not prepared</li> <li>A little bit prepared</li> <li>Pretty prepared</li> </ul>

All questions in the survey included a “Do not know” category. For question 7 and 8 participants were instructed to provide numeric answer in years.

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**Table 1**

Knowledge, implementation, and barriers to breast cancer screening reported by health unit coordinators ( $n = 1251$ ); GUIA, Brazil, 2011.<sup>a</sup>

<b>Breast cancer screening, <math>n</math> (%)</b>	
Do you know INCA recommendations for cancer screening?	
Yes	651 (55.1)
No	531 (44.9)
If yes, does your unit follow INCA recommendations for cancer screening?	
Yes	596 (93.1)
No	44 (6.9)
If yes, does your unit follow the INCA recommendations for the early detection of breast cancer?	
Yes	586 (98.3)
No	10 (1.7)
Does your unit carry out outreach or tracking activities for breast cancer?	
Yes	581 (97.7)
No	14 (2.3)
Does your unit follow-up with women who have not returned to discuss the results of mammography with a health professional?	
Yes	963 (78.9)
No	258 (21.1)
Barriers to breast cancer screening, $n$ (%)	
Difficulties in making X-rays	
Not a barrier	637 (52.2)
Sometimes a barrier	230 (18.8)
Definitely a barrier	354 (29.0)
Difficulty in marking X-rays	
Not a barrier	765 (62.3)
Sometimes a barrier	236 (19.2)
Definitely a barrier	227 (18.5)
Difficulty in making or re-scheduling an appointment	
Not a barrier	644 (52.6)
Sometimes a barrier	256 (20.9)
Definitely a barrier	324 (26.5)
Long wait time on exam day	
Not a barrier	629 (54.0)
Sometimes a barrier	241 (20.7)
Definitely a barrier	294 (25.3)
Difficulty scheduling to discuss mammogram results	
Not a barrier	851 (70.4)
Sometimes a barrier	166 (13.7)
Definitely a barrier	192 (15.9)

<sup>a</sup>Missing, refused, and don't know responses were not included in the table and subsequent percentage calculations.

**Table 2**Physicians' and nurses' demographic and professional characteristics ( $n = 529$ ); GUIA, Brazil, 2011.

Item	Physicians ( $n = 182$ )	Nurses ( $n = 347$ )	$\chi^2$ $p$ -value
Gender, %			
Male	56.6	15.3	< 0.0001
Female	43.4	84.7	
Age (year)			
Mean (SD)	40.5 (12.8)	32.6 (8.5)	< 0.0001 <sup>a</sup>
Race/ethnicity, %			
White	67.6	62.0	0.6362
Black	5.5	6.9	
Asian	2.8	3.5	
Mixed	24.2	27.7	
Region, %			
North	6.0	2.5	0.0173
Northeast	26.9	37.2	
Central-West	11.5	6.3	
Southeast	35.7	32.5	
South	19.8	21.6	
Years since graduation			
5	36.7	56.4	< 0.0001
6–15	30.0	34.0	
> 15	33.3	9.6	
Hours worked per week			
< 40 h	45.6	22.8	< 0.0001
40 h	54.4	77.2	
Patients seen per week			
0–50	18.5	42.6	< 0.0001
51–100	25.3	40.4	
> 100	56.2	17.0	

<sup>a</sup>Two sample  $T$ -test.

**Table 3**

Breast cancer related attitudes, perceptions, and practices of health professionals working in health care units ( $n = 529$ ); GUAI, Brazil, 2011.

Item, n (%)	Physicians (n = 182)	Nurses (n = 347)	$\chi^2$ p-value
<i>Attitudes and perceptions related to breast cancer screening</i>			
How prepared do you feel to talk to patients about breast cancer?			
Pretty much prepared	104 (57.1)	153 (44.1)	0.0043
A little or not prepared	78 (42.9)	194 (55.9)	
How effective is breast self-examination at reducing breast cancer mortality?			
Very effective	96 (54.6)	256 (75.3)	< 0.0001
Slightly or not effective	80 (45.4)	84 (24.7)	
How effective is a clinical breast exam in reducing breast cancer mortality?	116 (65.9)	256 (75.3)	0.0242
Very effective	60 (34.1)	84 (24.7)	
Slightly or not effective			
How effective are mammograms among women age 40–49 at reducing breast cancer mortality?			
Very effective	156 (88.6)	329 (96.2)	0.0008
Slightly or not effective	20 (11.4)	13 (3.8)	
How effective are mammograms among women age > 50 at reducing breast cancer mortality?			
Very effective	171 (98.3)	320 (94.7)	0.0516
Slightly effective	3 (1.7)	18 (5.3)	
At the health facility where you work, would you say that INCA breast cancer screening guidelines are:			
Very influential	96 (62.7)	190 (62.7)	0.9935
Not very or not influential	57 (37.3)	113 (37.3)	
<i>Practice and intentions</i>			
At what age do you start routine breast cancer screening in your patients?			
< 40	44 (25.1)	174 (50.9)	< 0.0001
40–45	75 (42.9)	123 (36.0)	
45–50	15 (8.6)	14 (4.1)	
> 50	15 (8.6)	11 (3.2)	
I do not screen for breast cancer	26 (14.9)	20 (5.9)	
How often do you request that your patients receive a clinical breast examination? <sup>a</sup>			
Every year	85 (57.4)	170 (53.0)	0.4073
Every two years	4 (2.7)	5 (1.6)	
Other	59 (39.9)	146 (45.5)	
How often do you request that your patients receive a mammogram? <sup>a</sup>			
Every year	107 (72.3)	236 (73.5)	< 0.0001
Every two years	36 (24.3)	35 (10.9)	
Other	5 (3.4)	50 (15.6)	

<sup>a</sup>Applies only to individuals who screen for breast cancer.

Breast cancer related attitudes and perceptions of physicians working in primary health care units, stratified by breast cancer practice and intentions ( $n = 156$ ); GUAU, Brazil, 2011.

**Table 4**

Breast cancer attitudes and perceptions	Breast cancer practice and intentions <sup>d</sup>					
	At what age do you start routine breast cancer screening in your patients?		How often do you request patients receive a clinical breast exam? <sup>a,b</sup>		How often do you request patients receive a mammogram? <sup>a,b</sup>	
	< 40	> 40	Annual	Biennial	Annual	Biennial
How prepared do you feel to talk to patients about breast cancer?						
Pretty much prepared	21 (47.7)	67 (63.8)	52 (61.2)	1 (25.0)	63 (58.9)	21 (58.3)
A little or not prepared	23 (52.27)	38 (36.2)	33 (38.8)	3 (75.0)	44 (41.1)	15 (41.7)
How effective is breast self-examination at reducing breast cancer mortality?						
Very effective	21 (47.7)	55 (52.4)	40 (47.1)	1 (25.00)	54 (50.5)	19 (52.8)
Slightly or not effective	23 (52.3)	50 (47.6)	45 (52.9)	3 (75.0)	53 (49.5)	17 (47.2)
How effective is a clinical breast exam in reducing breast cancer mortality?						
Very effective	26 (59.1)	67 (63.8)	50 (58.8)	3 (75.0)	71 (66.4)	18 (50.0)
Slightly or not effective	18 (40.9)	38 (36.2)	35 (41.2)	1 (25.0)	36 (33.6)	18 (50.0)
How effective are mammograms among women age 40–49 at reducing breast cancer mortality?						
Very effective	43 (97.7) <sup>*</sup>	89 (84.8) <sup>*</sup>	72 (84.7)	4 (100.0)	96 (89.7)	30 (83.3)
Slightly or not effective	1 (2.3) <sup>*</sup>	16 (15.2) <sup>*</sup>	13 (15.3)	0 (0.0)	11 (10.3)	6 (16.7)
How effective are mammograms among women age > 50 at reducing breast cancer mortality?						
Very effective	43 (100)	103 (99.0)	85 (100.0)	4 (0.0)	105 (99.0)	35 (100.0)
Slightly effective	0 (0.0)	1 (1.0)	0 (0.0)	0 (0.0)	1 (1.0)	0 (0.0)
At the health facility where you work, would you say that INCA breast cancer screening guidelines are:						
Very influential	25 (59.5)	61 (65.6)	48 (62.3)	3 (75.0)	67 (68.4)	17 (53.1)
Not very or not influential	17 (40.5)	32 (34.4)	29 (37.7)	1 (25.0)	31 (31.6)	15 (46.9)

<sup>a</sup> Only applies to individuals who screen for breast cancer.

<sup>b</sup> Limited to annual and biennial responses.

\* Chi-square  $\chi^2$  value < 0.05.

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Breast cancer related attitudes and perceptions of nurses working in primary health care units, stratified by breast cancer practice and intentions ( $n = 327$ ); GUAI, Brazil, 2011.

Table 5

Breast cancer attitudes and perceptions	Breast cancer practice and intentions <sup>a</sup>					
	At what age do you start routine breast cancer screening in your patients?		How often do you request patients receive a clinical breast exam? <sup>b</sup>		How often do you request patients receive a mammogram? <sup>b</sup>	
	< 40	> 40	Annual	Biennial	Annual	Biennial
How prepared do you feel to talk to patients about breast cancer?						
Pretty much prepared	75 (43.1)	71 (48.0)	76 (44.7)	4 (80.0)	109 (46.2)	14 (40.0)
A little or not prepared	99 (56.9)	77 (52.0)	94 (55.3)	1 (20.0)	127 (53.8)	21 (60.0)
How effective is breast self-examination at reducing breast cancer mortality?						
Very effective	134 (77.0)	107 (73.3)	119 (70.4)	4 (100.0)	175 (74.1)	25 (73.5)
Slightly or not effective	40 (23.0)	39 (24.7)	50 (29.6)	0 (0.0)	61 (28.9)	9 (26.5)
How effective is a clinical breast exam in reducing breast cancer mortality?						
Very effective	135 (77.6)	102 (69.9)	123 (72.8)	4 (100.0)	174 (74.0)	22 (64.7)
Slightly or not effective	39 (22.4)	44 (30.1)	46 (27.2)	0 (0.0)	61 (26.0)	12 (35.3)
How effective are mammograms among women age 40–49 at reducing breast cancer mortality?						
Very effective	169 (97.1)	140 (94.6)	163 (95.9)	5 (100.0)	228 (96.6)	35 (100.0)
Slightly or not effective	5 (2.9)	8 (5.4)	7 (4.1)	0 (0.0)	8 (3.4)	0 (0.0)
How effective are mammograms among women age > 50 at reducing breast cancer mortality?						
Very effective	164 (95.9)	139 (93.9)	161 (95.3)	5 (100.0)	223 (95.3)	33 (97.1)
Slightly effective	7 (4.1)	9 (6.1)	8 (4.7)	0 (0.0)	11 (4.7)	1 (2.9)
At the health facility where you work, would you say that INCA breast cancer screening guidelines are:						
Very influential	96 (61.9)	90 (67.2)	100 (65.8)	2 (40.0)	147 (68.7)	18 (56.2)
Not very or not influential	59 (38.1)	44 (32.8)	52 (34.2)	3 (60.0)	67 (31.3)	14 (43.8)

<sup>a</sup> Only applies to individuals who screen for breast cancer.

<sup>b</sup> Limited to annual and biennial responses.